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10:1 frequency range. One can obtain a VSWR less than 3:1 with the beams staying fairly constant over the entire antenna bandwidth with the lobe having about an 80° or 90° beam width.

As can be seen, the Vivaldi notch antennas are single lobe antennas which have a very wide bandwidth and are unidirectional in that the beam remains relatively constant as a single lobe over a 10:1 bandwidth both in elevation and in azimuth.

Note that a constant beam width is maintained because at high frequencies at the throat of the notch only a small area radiates. As one goes lower and lower in frequency, the wider parts of the notch are responsible for the radiating. As a result, the beam width tends to remain constant and presents itself as a single lobe.

The Vivaldi notch antennas were first described in a monograph entitled The Vivaldi Aerial by P.G. Gibson of the Phillips Research Laboratories, Redhill, Surrey, England in 1978 and by Ramakrishna Janaswamy and Daniel H. Schaubert in IEEE Transactions on Antennas and Propagation, vol. AP-35, no.1, September 1987. The above article describes the Vivaldi aerial as a new member of the class of aperiodic continuously scaled antenna structures which has a theoretically unlimited instantaneous frequency bandwidth. This antenna was said to have significant gain and linear polarization that can be made to conform to constant gain versus frequency performance. One reported Gibson design had been made with approximately 10 dB gain and a minus -20 dB side lobe level over an instantaneous frequency bandwidth extending from below 2 GHz to about 40 GHz.

One Vivaldi notch antenna is described in U.S. Patent 4, 853, 704 issued August 1, 1989 to Leopold J. Diaz, Daniel B. McKenna, and Todd A. Pett. The Vivaldi notch has been utilized